

Memory at the Sharp End:

The costs of remembering through conversations with others in applied contexts

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Abstract

In many applied contexts where accurate and reliable information informs operational decision-making, emergency response resource allocation, efficient investigation, judicial process and, ultimately, the delivery of justice, the costs of unfettered conversational remembering can be high. To date, research has demonstrated that conversations between co-witnesses in the immediate aftermath of witnessed events and co-witness retellings of witness events often impair both the quality and quantity of information reported subsequently. Given the largely negative impact of conversational remembering on the recall of both individual witnesses and groups of witnesses in this context, this review explores the reasons why these costs occur, the conditions under which costs are exacerbated, and how, in practical terms, the costs can be reduced in order to maximise the accuracy and completeness of witness accounts.

Consider the aftermath of a major incident or terrorist attack: multiple confused, shocked, distressed and possibly injured victims and witnesses at the scene; emergency response personnel from several agencies attempting to make sense of, and devise an appropriate response to, an unclear and potentially evolving situation; and a wider public actively seeking updates about the incident as it unfolds on news and social media. Securing accurate and detailed accounts about what actually happened from victims, witnesses, and operational responders is critical, not only for the immediate security of those present at the scene (particularly if the perpetrator is still at large), but also to ensure the effective and efficient pursuit of justice for the perpetrators of such crimes. In the aftermath of such incidents, the crime scene is usually cordoned off with precautions taken to protect against the contamination of potential evidence. Unfortunately, witness memory is rarely afforded the same protections. Witnesses are not usually warned against discussing their experiences with other witnesses or advised to avoid accessing accounts of the incident on social media or

news outlets prior to interview. Worse still, witnesses are sometimes interviewed in front of each other or corralled in groups into the same holding room prior to interview. Failure to treat witness memory as a 'crime scene' can exert significant costs for subsequent investigations.

A number of well-documented real life examples highlight the costs associated with distorted witness memory as a result of conversation-based (mis)remembering. Following the Oklahoma bombing in 1995, a terrorist incident in which 168 people died and over 600 were injured, key prosecution evidence was drawn from interviews with witnesses who worked at the car hire company where the bomber, Timothy McVeigh, hired the truck which he subsequently loaded with explosives used to bomb a federal building. Three witnesses encountered McVeigh when he hired the truck but only one of the witnesses claimed, in an initial interview, that McVeigh had been with an accomplice. Later, following conversations between the witnesses (who were co-workers), the other two witnesses claimed to remember details of a second person hiring the truck with McVeigh. These apparently corroborative accounts led to a costly and, ultimately, futile investigative search for this supposed accomplice (see Memon & Wright, 1999).

The murder of the Swedish foreign minister in Stockholm in 2003 provides an even more acute example of the costs of conversational remembering. With the hunt for the perpetrator underway, police gathered witnesses together in a room to prevent them leaving the scene of the crime prior to being interviewed. While together, the witnesses discussed what they had seen. One witness mentioned that the perpetrator had been wearing a camouflage-patterned military jacket. Subsequently, a number of witnesses reported this clothing description to the investigating officers. This information informed an immediate search for the perpetrator in the surrounding area, and also featured in a national police alert. However, surveillance camera footage showed that the perpetrator had, in fact, been wearing

a grey hooded sweatshirt when he committed the murder. Given the specific nature of the error, it seems that co-witness contamination during the discussions was the source, leading to false leads and lost time at the critical stages of the investigation (see Granhag, Ask, Rebelius, Öhman, & Mac Giolla, 2013).

Irrespective of the potential for memory distortion, conversations between operational witnesses, such as firearms response teams, can also generate negative public perceptions, particularly where incidents involved lethal use of force. For example, an inquiry following the death of Robert Dziekanski in Vancouver in 2007 (following a Taser intervention by RCMP officers) commented on the problematic nature of the accounts provided by officers following their conversations, noting that “discussions resulted in them giving surprisingly similar accounts of the incident” (Braidwood, 2010, p.265). Similar questions were raised in the UK following the shootings of Mark Saunders and Mark Duggan by armed officers in London in 2008 and 2011 respectively. In this context, officers tend to view team conversations or conferring as necessary to facilitate a reliable overall account of an incident (Baines, 1987). However, criticism of police conferring practice in media and legal circles highlights not only concerns about the reliability and independence of testimony provided by individual officers but also issues relating to the transparency of police activities (Heaton-Armstrong & Wolchover, 1993; Heaton-Armstrong & Wolchover, 2009; Clark & Stephenson, 1999; see also Hope, Gabbert, & Fraser, 2013).

These examples, drawn from high profile incidents, reflect the real world costs associated with conversational remembering in investigative contexts. These costs result in (i) impaired investigative efficiency as a result of the allocation of limited resources to false leads, and/or (ii) impaired public perceptions of law enforcement agencies due to lack of transparency. These cases illustrate that unfettered conversational remembering can result in impaired evidence and impaired integrity of the investigative process. In this article, we will

examine the process by which conversational remembering comes to exert a cost in this context and assess the extent to which research offers effective solutions.

Conversational Remembering in Eyewitness Contexts

Early work on naturalistic conversational remembering revealed that generating a shared version of an experience is a common goal of discussions and that people ‘negotiate’ memories by influencing what each other remembers (see Edwards & Middleton, 1986a, 1986b, 1987; Middleton & Edwards, 1994). Pasupathi and colleagues (Pasupathi, 2001; Pasupathi, Stallworth & Murdoch, 1998) demonstrated that conversational reconstructions of memory can influence subsequent memory retrieval, such that the *reconstructed* memories (rather than the original memories) become what is remembered on future occasions. In the context of eyewitness memory for witnessed events, research indicates that conversational remembering can result not only in reduced output (Basden, Basden, Bryner, & Thomas, 1997; Wright, Self & Justice, 2000) but also the distribution of errors (Gabbert, Memon, & Wright, 2003; Meade & Roediger, 2002). This vulnerability of memory in terms of both quantity and quality is particularly costly in eyewitness contexts and constitutes a real concern for those charged with establishing the reliability of witness accounts.

Witnesses frequently discuss what they have seen with co-witnesses at the scene of crime incidents (Paterson & Kemp, 2006; Skagerberg & Wright, 2008). Despite initial differences in recollections, research shows that when witnesses discuss their memories they can influence each other such that their subsequent individual memory reports become similar. This phenomenon is referred to as ‘memory conformity’ (Gabbert & Hope, 2013; Wright, Memon, Skagerberg, & Gabbert, 2009). Exposure to misleading post-event information during discussions with others results can be a particularly powerful form of suggestion. For example, Gabbert, Memon, Allan, and Wright (2004), and Paterson and

Kemp (2006) found that people are most suggestible when post-event information is encountered directly from a co-witness in the context of a social interaction (cf. when it is encountered indirectly; see also Meade & Roediger, 2002).

The implications of memory conformity in the witnessing context are significant. First, seemingly independent witness accounts that have been contaminated, or otherwise distorted, by information obtained from other witnesses will likely appear to corroborate each other. Second, it is unlikely that investigators will easily be able to identify the source, trajectory, or impact of introduced errors simply by reviewing witness statements. Given the importance of independent and reliable individual accounts within the investigative process and legal system, a growing body of research has investigated the consequences of witnesses discussing their memories together prior to providing a statement.

In early research on memory conformity, Gabbert et al. (2003) showed mock-witnesses a filmed simulated crime. Two versions of the crime film were recorded from different angles to simulate different witness vantage points for the same incident. Critically, this manipulation allowed unique features of the event to be observed by each participant. A significant proportion of witnesses (71%) who had discussed the event reported at least one (of two) erroneous detail acquired during the discussion with their co-witness. This finding has been replicated in numerous experiments (for reviews, see Gabbert & Hope, 2013; Gabbert & Wheeler, 2017).

How can we account for this effect of conversational remembering on witness memory? Research suggests that a person might rely on or conform to another person's memory report rather than reporting their own recollections for (at least) three different reasons. First, they might wish to avoid a (potentially) socially awkward disagreement with the other person. Second, they might believe the other person is actually correct. From a theoretical perspective these reasons reflect, respectively, normative and informational

motivations to conform (Deutsch & Gerard, 1955). *Normative* motivations to conform often reflect an individual's need for social approval, and manifest as public declarations of agreement despite private disagreement. Thus, a person might outwardly agree with another person's recollected version of events, but do not privately believe that is what happened (Cialdini & Goldstein, 2004; Deutsch & Gerard, 1955). *Informational* motivations to conform relate to a desire to be accurate and are often evident in situations whereby an individual doubts the accuracy their own memory or when the information encountered from another individual convinces them that their initial judgment was erroneous (see Cialdini & Goldstein, 2004 for a comprehensive review; see also Wright, London, & Waechter, 2010, for an integrative framework). A further possibility is that a witness might construct a false or distorted memory based on what a co-witness has said - perhaps through a source-monitoring error whereby the post-event information is remembered but the source of this information has been forgotten (Gabbert, Memon, & Wright, 2007; Paterson, Kemp, & Forgas, 2009). *Conversational remembering and normative motivations to conform.*

Normative motivations to conform are primarily social in nature. A person might outwardly agree with another person's recollected version of events, but not privately believe that the version of events they are agreeing with is what actually happened. Thus, normative influence is most often observed when participants are tested together and responses are given publicly rather than privately and when costs of disagreeing are high (see Allan & Gabbert, 2008; Schneider & Watkins, 1996; Shaw Garven, & Wood, 1997). For example, memory conformity effects are typically larger when witnesses know each other, with participants more likely to report information acquired from a friend or romantic partner than from a stranger (French, Garry, & Mori, 2008; Hope, Ost, Gabbert, Healey, & Lenton, 2008; but see Oeberst & Seidemann, 2014), and from an in-group than from an out-group partner

(Andrews & Rapp, 2014). Similarly, Wheeler, Allan, Tsivilis, Martin, and Gabbert (2013) observed an enhanced conformity effect towards 'similar others' on a memory task. [LH1]

Conversational remembering and informational motivations to conform.

Informational motivations to conform represent a desire for accuracy and emerge when a witness reports post-event information suggested by a co-witness because they believe it to be correct. As such, informational accounts of memory conformity align well with the witnessing context where providing an accurate account should be perceived as important and potentially consequential. To examine this phenomenon, research has manipulated the perceptions and knowledge of each person engaged in conversational remembering about a witnessed event (e.g., relative credibility, age, perceived and actual encoding duration).

Results suggest that memory conformity is often the result of a strategic trade-off, with the aim of balancing ones' own memory accuracy with that of a co-witness. For example, Allan et al. (2012) showed that individuals who believed they had an inferior memory to their partner were more likely to become influenced by, and subsequently report, erroneous post-event information encountered during collaborative remembering. However, this conformity only occurred when the individual's initial memory representation was weak, (see also Paterson et al., 2009; Wright & Villalba, 2012). Similarly, Horry, Palmer, Sexton, and Brewer (2012) noted that, on a face recognition task, participants were more likely to conform when their confidence in their answer was low.

In alignment with this general finding, a number of similar studies have examined the role of perceived co-witness credibility in memory conformity, observing that people are more likely to conform to a relatively more credible source. Davis and Meade (2013) found that both young and older adult participants were less likely to incorporate information from an older adult source (see also Kwong See, Hoffman & Wood, 2001). Thus, it appears reliance on other people's memory is dynamic and strategically adjusted according to our

knowledge of conditions under which we and other people have acquired information and the extent to which we perceive them as credible (for overview see Blank, Walther, & Iseman, 2017).

However, research has also revealed some interesting and seemingly conflicting findings pertaining to source credibility and how it comes to influence (or not) our memories. Recent work suggests that individuals are not necessarily effective in evaluations of the likely accuracy of a source. For example, Jaeger, Lauris, Slemeczy, and Dobbins (2012) found that, in a recognition test, participants conformed to reliable and unreliable sources to the same extent. Of particular interest was the finding that this apparently non-discriminating reliance on external sources did not impair recognition performance overall. A similar pattern of indiscriminate conformity was also observed in recall by Numbers, Meade, and Perga (2014) irrespective of whether the source of the information was reasonably reliable (33% incorrect) or entirely unreliable (100% incorrect).

There are a number of potential reasons why people might conform apparently indiscriminately. First, they may not be sufficiently motivated to interrogate the credibility of the source. Alternatively, they may be unable to extract sufficient information to discriminate effectively. Jaeger et al. (2012) explain their findings with reference to the phenomenon of ‘low-confidence outsourcing’ whereby people rely on the external source only when they have very low confidence in the accuracy of their own responses. This notion of low confidence outsourcing explains how indiscriminate conformity can produce performance increments when the source happens to be accurate, but is unlikely to unduly impair performance (overall) if the source is inaccurate.

Most recently, Zawadzka, Krogulska, Button, Higham, and Hanczakowski (2016) examined whether people who were permitted to exercise metamemorial control by withholding answers would avoid indiscriminate conformity. Results suggest that people do

indeed fail to effectively extract information about source reliability although, interestingly, results showed that participants who correctly identified the reliable source conformed more to the reliable source. Zawadzka et al. (2016) also observed a facilitative effect of feedback such that when participants were given feedback regarding accuracy they were better able to discriminate between reliable and unreliable sources. Interestingly, the methodology used in this research distinguishes between internalized and non-internalized memory conformity. Specifically, the authors observed that internalized conformity occurred when participants believed that the information provided by an external source was reliable. However, they also observed that non-internalized conformity occurred even when people did not necessarily believe that the information source was reliable. The marker here as to whether the effects observed reflected internalized or non-internalized memory conformity was responses volunteered; specifically, increased volunteering of responses accompanied internalized but not non-internalized conformity. These findings have important implications for future research exploring conformity in eyewitness contexts – and the identification of interventions to mitigate the effects of memory conformity.

Normative and informational motivations to conform are not likely to occur in isolation or at the same point of the remembering process. Blank (2009) conceives of the effects of social influence on remembering in stages and argues “the selection of memory information to be communicated is guided by conversation norms and social goals and memory reports may be modified according to such norms and goals as well as in response to reinforcement/punishment contingencies” (p.171). Accordingly, Blank (2009) argues that social influence is informational in nature at the ‘memory validation’ phase concerned with establishing belief and confidence in the accessed memory information. In contrast, social influence is normative in nature at the communication stage where it “serves to bring the memory report into a socially accepted and useful form” (p.171).

Conversational remembering and memory distortion

Arguably, if post-event information is reported due to normative or informational motivations to conform, then it should be possible for an individual to disregard information obtained from a co-witness, and to access and report the originally encoded information if required. However, conversational remembering can also result in memory distortion. Source-monitoring errors, whereby the post-event information is remembered but the source of this information has been forgotten (see Johnson, Hashtroudi, & Lindsay, 1993), are likely to underpin memory distortions as a result of conversational remembering. In this context, a source monitoring error might occur when a witness claims to remember particular details that were actually encountered during conversational remembering with a co-witness. Source confusion errors increase when there is an overlap in the memory characteristics from two different sources (Henkel & Franklin, 1998; Markham & Hynes, 1993). In cases where misleading post-event information is encountered during conversational remembering, this error is likely given a large amount of contextual overlap for individuals who share an experience and then discuss it. In a related vein, Nash, Wheeler, and Hope (2015) explore how post-event information that feels plausible or familiar is more likely to be misattributed to memory as opposed to an external source.

Research has explored the extent to which source-confusions of this nature account for the memory conformity effect. Gabbert et al. (2007) examined whether misleading post-event information encountered during conversational remembering was subsequently reported due to informational motivations to be correct, or because of a source-monitoring error. In a source monitoring test, approximately half of the details encountered as post-event information were correctly categorised as having been encountered in the co-witness discussions. However, about half were incorrectly attributed to having been seen in original stimulus event (see Paterson et al., 2009; Paterson, Kemp & Ng, 2011; but see Bodner et al.,

2009, Experiment 1). The finding that source judgments can be wrong, even with deliberate consideration, confirms that being able to recall ‘memories’ does not necessarily guarantee their authenticity. Due to the nature of human memory, it is not surprising that conversational remembering can sometimes lead to memory distortions.

Are there any costs of conversational remembering for a single witness?

There does not necessarily need to be a co-witness present for a witness’s account of an event to become distorted via conversational remembering. Simply re-telling their story, perhaps to journalists or news reporters at the scene, may also result in subsequent error. In conversational remembering, speakers tend to focus more on emotional reactions to events, rather than providing detailed accounts, or presenting events in a stable chronological order (Hyman, 1994; Marsh, 2007; Marsh, Tversky, & Hutson, 2005; Tenney, 1989). Further, if the purpose of that retelling is to engage, entertain, or gain attention, research suggests that speakers have a tendency to exaggerate (Dudukovic, Marsh, & Tversky, 2004). In particular, speakers alter (or ‘tune’) their retellings of experienced events in conversational remembering to suit a particular audience (see Echterhoff, Lang, Krämer, & Higgins, 2009; Kopietz, Hellmann, Higgins, & Echterhoff, 2010). As such, memory reports in conversation are the product of both the speaker and their social environment (Pasupathi, 2001).

Pasupathi et al. (1998) showed how listeners can influence the way in which a person shares a memory, simply by their level of ‘responsiveness’ (e.g., attentiveness, nodding, encouragement, etc). This perceived responsiveness influenced not only the speaker’s immediate retelling of events, but also subsequent recollections of those events under different circumstances. Similarly, Marsh, Tversky, and Hutson (2005) examined different ways in which a crime event might be recounted depending on the audience, for example, the account might be told factually to a police investigator, but be more embellished or

dramatized to friends. As expected, qualitative differences were found in the initial account depending on who the participants were sharing their memories with and, critically, qualitatively different initial retellings led to quantitative differences in later memory reports (see also Soleti, Wright, & Curci, 2017). More recently, Paterson, Whittle and Kemp (2015) examined the effects of different post-event debriefing formats where participants are encouraged to discuss their experiences. Participants who discussed an unpleasant event with a focus on the facts included more misinformation than controls, and participants who discussed the same unpleasant event with a focus on their emotion reaction reported more confabulated items than controls. Taken together, there is evidence to suggest that conversational retellings can have a significant impact on individual, and that once a memory has been altered through conversation, subsequent retellings are more likely to reflect the most recent retelling, rather than the original memory memories (see, for example, Rechdan, Sauerland, Hope, & Ost, 2016).

Conversational Remembering in Operational Teams

In many professional and operational contexts (e.g. police and emergency response, military units, surgical teams), team members are debriefed together following incidents and, in the course of debriefings, discuss and exchange information about what happened. While in some professions and for some incidents, this process can result in quite negative public perceptions (e.g. policing), in others it goes almost entirely unremarked upon (e.g. surgery; Hope, 2017).

Beyond any potentially beneficial effects of team support, the question is whether team conferring of this nature is actually beneficial in terms of increasing the overall accurate amount of information reported across the team. There is some evidence that collaborative remembering generates more output than individual remembering (e.g. Andersson &

Rönnberg, 1995; Clark, Stephenson, & Kniveton, 1990; see Rajaram & Pereira-Pasarin, 2010) and, as such, may result in a more comprehensive account (Ross, Blatz, & Schryer, 2008). However, research literature on collaborating groups suggests that remembering with others is typically associated with reduced recall output. In terms of output quantity, collaborative memory performance is usually greater than that of the best performing individual, but less than nominal group performance (see Weldon, 2000, for a review). This ‘collaborative inhibition’ effect is most likely caused by disruption to each individual’s retrieval strategies (Basden, Basden, Bryner, & Thomas, 1997; Weldon, Blair, & Hesbsch, 2000; see Marion & Thorley, 2016 for recent meta-analytic review).

Group conversation contexts without the specific function of collaborative recall can also produce memory errors from a group source. For instance, in a study exploring the effects of group psychological debriefing following exposure to a stressful incident, Devilly, Varker, Hansen, and Gist (2007) found that simply hearing (erroneous) post-event information from another group member affected individual memories for that incident.

Memory contamination following social remembering is a problematic phenomenon for investigators, as an eyewitness error changes from being an individual recall error to producing an apparent consistency (and, consequently, perceived accuracy) across several accounts. Such false consistency may mislead the subsequent investigation and Court proceedings. In the case of police witnesses who become susceptible to what Braidwood (2010) deems “innocent contamination” (p.264), inadvertent false consistency may also lead to damaging allegations of willful collusion or a cover-up where none has deliberately taken place. In a study designed to examine recall of conferring operational witnesses for a simulated interactive scenario, Hope, Gabbert, and Fraser (2013) reported no apparent *overall* impact (positive or negative) of group discussions on either the accuracy or amount of information subsequently reported in individual statements (relative to statements produced

by officers who did not engage in such discussions). However, the process of conferring affected officers' ability to calibrate their confidence in the accuracy of their account against objective accuracy (see Koriat, Adiv, Schwarz, 2016). Thus, although the content of statements was not necessarily affected by the conferring process, officers' metacognitive beliefs concerning their own recall of the incident were altered by discussing the incident with their team colleagues (see also Stephenson, Clark, & Wade, 1986; Clark et al., 1990). Further, a qualitative examination of team discussions revealed that errors were exchanged during the course of conferring. While some errors were corrected during this process, some errors were transmitted to other team members. Thus, errors that originated from a single officer came to be reported by several officers who, as a result, appeared to corroborate each other.

These findings run counter to typical findings for collaborative memory: in laboratory experiments collaborating groups typically remember more than individuals (Basden et al., 1997). However, such experiments are usually conducted using participants who have no prior relationships or shared relevant expertise. Police officers, and indeed others in professional teams are likely in possession of *expertise*, a proficiency shown to affect cognitive performance in real world situations (Burrows, 2007). Research on expert team performance suggests that such teams are less likely to display collaborative inhibition and may, in fact, show different patterns of recollection than novices (Vincente & Wang, 1998; see also Rajaram & Pereira-Pasarin, 2010). Furthermore, experts process information in a different way to novices (Morrow et al., 2008). In teams, experts are likely to share similar encoding strategies given their familiarity or expectancies about different situations (Meade, Nokes, & Morrow, 2008). Further research is needed to explore the precise mechanisms through which domain expertise contributes to memory performance in applied settings.

Implications of Conversational Remembering

It is clear that there are potentially significant costs associated with conversational remembering in applied forensic contexts. Critically, witness accounts need to be accurate – and independent. From an investigative perspective, the nature of the errors likely to arise as a result of conversational remembering run the risk of (i) generating false leads which inevitably waste time and investigative resources and (ii) providing the illusion of corroboration which may prematurely (and inaccurately) shut down exploration of other lines of inquiry. However, recent research suggests that there may be other applied implications. For example, work by Thorley and colleagues (Thorley, 2015; Thorley & Kumar, 2017; Thorley & Rushton-Woods, 2013) has examined the ‘blame conformity’ that can occur as a consequence of encountering co-witness information. Thorley and Rushton-Woods (2013) observed that attributions of blame for an incident (in this case, a simulated accident involving two men) varied as a function of information obtained from co-witnesses. Specifically, when no blame was mentioned, less than 2% of participants attributed blame; however, when the co-witness statement blamed one of the men for the accident, 37% of participants attributed blame to the same individual (see also Gabbert et al., 2003, who found 60% of participants attributed guilt for a crime they had not actually witnessed based on information obtained from a co-witness).

A further potential cost related to conversational remembering is highlighted by recent evidence that co-witness information can affect identification decisions. Gabbert, Memon, and Wright (2007) manipulated co-witness confidence and accuracy across both target present and target absent lineups, and found that in comparison to a control group, participants who knew that a co-witness had said that the suspect was not present were more likely to incorrectly reject the lineup. Levett (2013) observed that witnesses were more likely to choose from a lineup if aware that a co-witness had also chosen from a lineup.

Problematically, witness confidence also appeared to align with that of the co-witness. This type of ‘confidence conformity’ has also been reported by Goodwin, Kukucka, & Hawks, (2013) and Goodwin, Hannah, Nicholl, & Ferri (2017).

Misinformation obtained from a confederate about a suspect's facial features has also been shown to influence identification decisions. For example, Eisen, Gabbert, Ting, and Williams (in press) found that misinformation about a perpetrator's appearance can affect a co-witness's memory for the perpetrator, and, in turn, impact that witness's ability to make accurate identification decisions when viewing subsequent lineups (see also Zajac & Henderson, 2009). Coupled with findings by Horry et al. (2012) and Jaeger et al. (2012), these findings suggest that co-witness contamination in identification contexts can produce situations in which legal decision makers are presented with confident identifications that are actually incorrect.

Reducing the Costs of Conversational Remembering

Given the potential costs of conversational remembering in applied contexts, identifying solutions and pragmatic prophylactics is imperative. As conversations at the scene of an incident are an entirely human response to an unexpected event and, as such, highly likely (Paterson & Kemp, 2006; Skagerberg & Wright, 2008), there are limited actions investigators can take to completely eradicate opportunities for cross-witness contamination. One immediate solution is to separate and individually interview witnesses as soon as possible after an incident (see Gabbert, Hope & Fisher, 2009; Hope, Gabbert & Fisher, 2011). Research has also identified a number of other (at least partially) effective solutions to reduce the impact of encountering co-witness misinformation (e.g. Paterson, Kemp & Ng, 2011). The use of warnings can, in some cases at least, attenuate misinformation effects. For example, a meta-analysis by Blank and Launay (2014) evaluated the results of 25 post-

warning studies and concluded that warnings are partially effective, reducing the reporting of misinformation by an average of 50%.

Other research suggests there may be a protective effect of initial individual retrieval such that an early detailed recall inoculates against misinformation effects (e.g. Huff, Davis, & Meade, 2013; Huff, Weinsheimer & Bodner, 2016; but see Chan, Thomas, & Bulevich (2009). Pansky and Teneboim (2011) found that the initial testing for specific details of a witnessed event reduced suggestibility relative to initial testing of broader more-gist like details. Testing the Self-Administered Interview (SAI ©; Gabbert, Hope, & Fisher, 2009), a reporting tool designed to elicit detailed, initial accounts from witnesses, Gabbert, Hope, Fisher and Jamieson (2012) also noted reduced suggestibility to misinformation when such an account had been provided prior to exposure to misinformation (see also Memon, Zaragoza, Clifford, & Kidd, 2010).

Vredevelt, Hildebrandt and van Koppen (2016) examined whether co-witnesses might in fact work to ‘prune’ each other’s mistakes. Critically, in the experimental design, pairs of witnesses (who knew each other for an average of 31 years) were interviewed *individually* prior to engaging in a collaborative interview. Although collaboration did not result in witnesses reporting more about the event, collaborative pairs reported fewer errors than nominal pairs (see also Vredeveltdt, Groen, Ampt, & van Koppen, 2016). This pattern of results was also reported by Hope, Gabbert and Fraser (2013) in a sample comprising teams of firearms officers. Qualitative analyses revealed officers who conferred with other officers in their team while preparing their written statements exchanged errors with other team members and almost half of these errors were incorporated into another officer’s account. However, when officers completed a detailed initial retrieval before engaging in collaborative discussions no errors were transmitted into the final accounts of other officers.

Conclusions

The costs of unfettered conversational remembering in witnessing contexts can be significant. Further, individual and group retellings and conversations – both emotional and factual – are increasingly likely in the social media era, both immediately and over time (see, for example, Fagin, Cyr, & Hirst, 2015). This trend is increasingly problematic for investigators as witnesses discuss their experiences not only with co-witnesses at the scene but also in news and social media outlets – often before having been formally interviewed by the police. Beyond witnessing contexts, this challenge is also relevant for those charged with eliciting and assessing intelligence from sources who might well have received that information second-hand, discussed it with family, friends, or other associates, or encountered it in shared or negotiated experience with others.

There are no ‘silver bullet’ solutions to entirely eradicate the effects of a well-documented and, in many cases, entirely adaptive human memory phenomenon. However, research has identified a number of interventions (e.g., careful witness management, use of warnings, early individual accounts) to attenuate the potential effects of co-witness influence on the reliability of witness accounts. Practitioners in investigative, legal and policy contexts would be well advised to incorporate this substantial evidence-base in their forward training and practice.

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